

CLAIMS

What is claimed is:

1. An isolated nucleic acid comprising the nucleotide sequence SEQ ID NO:1.
- 5 2. An isolated nucleic acid having at least 80% nucleotide sequence similarity to a nucleic acid encoding a polypeptide comprising the amino acid sequence SEQ ID NO:2.
3. An isolated nucleic acid comprising a nucleotide sequence which consists of the coding region of zebrafish *ferroportin1*.
- 10 4. An isolated nucleic acid comprising a nucleotide sequence which encodes a contiguous portion of at least about 15 amino acids of SEQ ID NO:2.
5. An isolated nucleic acid comprising a nucleotide sequence which encodes a naturally occurring allelic variant of a polypeptide consisting of the amino acid sequence of a zebrafish Ferroportin1 protein, wherein said nucleic acid molecule
15 hybridizes under high stringency conditions to the complement of the sequence SEQ ID NO:1.
6. An isolated nucleic acid molecule which encodes a polypeptide having an iron transport function, wherein said molecule hybridizes under high stringency
20 conditions to SEQ ID NO:1 or its complement.
7. An isolated nucleic acid which hybridizes under high stringency conditions to nucleic acid consisting of nucleotides 238 through 1926 within SEQ ID NO:1.

8. An isolated nucleic acid molecule encoding a fusion polypeptide, said nucleic acid molecule comprising a nucleotide sequence encoding all or a portion of an amino acid sequence SEQ ID NO:2, and further comprising a nucleotide sequence encoding a heterologous portion of said fusion polypeptide.
- 5 9. An isolated nucleic acid comprising a nucleotide sequence which encodes a protein comprising the amino acid sequence SEQ ID NO:2, or SEQ ID NO:2 with conservative amino acid substitutions.
- 10 10. A nucleic acid vector comprising nucleic acid having at least 80% nucleotide sequence similarity to a nucleic acid encoding a polypeptide comprising the amino acid sequence SEQ ID NO:2, operably linked to an expression control sequence.
- 15 11. A nucleic acid vector comprising nucleic acid encoding a fusion polypeptide, said nucleic acid molecule comprising a nucleotide sequence encoding all or a portion of an amino acid sequence SEQ ID NO:2, and further comprising a nucleotide sequence encoding a heterologous portion of said fusion polypeptide.
- 20 12. A nucleic acid vector comprising nucleic acid comprising a nucleotide sequence which encodes a protein comprising the amino acid sequence SEQ ID NO:2, or SEQ ID NO:2 with conservative amino acid substitutions.
- 20 13. A nucleic acid expression vector comprising a coding sequence encoding zebrafish Ferroportin1.
14. A nucleic acid vector comprising a nucleic acid with at least 80% nucleotide sequence similarity to the coding region of SEQ ID NO:1.

15. A nucleic acid vector comprising a nucleic acid encoding a fusion polypeptide, said nucleic acid comprising a nucleotide sequence which encodes a contiguous portion of at least 15 amino acids of SEQ ID NO:2.
16. A cultured cell comprising the vector of Claim 10.
- 5 17. A cultured cell comprising the vector of Claim 11.
18. A cultured cell comprising nucleic acid having at least 80% nucleotide sequence similarity to a nucleic acid encoding a polypeptide comprising the amino acid sequence SEQ ID NO:2.
- 10 19. A cultured cell comprising nucleic acid comprising a nucleotide sequence which encodes a contiguous portion of at least about 15 amino acids of SEQ ID NO:2.
20. A cultured cell comprising nucleic acid comprising a nucleotide sequence which encodes a polypeptide having an iron transport function, wherein said nucleic acid hybridizes under high stringency conditions to SEQ ID NO:1 or its complement.
- 15 21. A method for producing a polypeptide, said method comprising culturing the cell of Claim 18 under conditions in which the cell produces the polypeptide.
22. A method for producing a polypeptide, said method comprising culturing the cell of Claim 20 under conditions in which the cell produces the polypeptide.

23. A method for producing a polypeptide, said method comprising culturing the cell of Claim 20 under conditions in which the cell produces the polypeptide, and isolating the polypeptide from the cell.
- 5 24. An isolated nucleic acid comprising the nucleotide sequence SEQ ID NO:3.
25. An isolated nucleic acid having at least 80% nucleotide sequence identity to a nucleic acid encoding a polypeptide comprising the amino acid sequence SEQ ID NO:3.
- 10 26. An isolated nucleic acid comprising a nucleotide sequence which consists of the coding region of mouse Ferroportin1.
27. An isolated nucleic acid comprising a nucleotide sequence which encodes a contiguous portion of at least 175 amino acids of SEQ ID NO:4.
- 15 28. An isolated nucleic acid consisting of a sequence of at least 510 contiguous nucleotides complementary to a region between nucleotides 298 and 2010 of SEQ ID NO:3.
- 20 29. An isolated nucleic acid comprising a nucleotide sequence which encodes a naturally occurring allelic variant of a polypeptide consisting of the amino acid sequence of a Ferroportin1 protein, wherein said nucleic acid molecule hybridizes under high stringency conditions to the complement of the sequence SEQ ID NO:3.

30. An isolated nucleic acid which encodes a polypeptide having an iron transport function, wherein said molecule hybridizes under high stringency conditions to SEQ ID NO:3 or its complement.
31. An isolated nucleic acid encoding a fusion polypeptide, said nucleic acid molecule comprising a nucleotide sequence encoding all or a portion of an amino acid sequence SEQ ID NO:4, and further comprising a nucleotide sequence encoding a heterologous portion of said fusion polypeptide.
32. An isolated nucleic acid comprising a nucleotide sequence which encodes a protein comprising the amino acid sequence SEQ ID NO:4, or SEQ ID NO:4 with conservative amino acid substitutions.
33. A nucleic acid vector comprising nucleic acid having at least 80% nucleotide sequence identity to a nucleic acid encoding a polypeptide comprising the amino acid sequence SEQ ID NO:4.
34. A nucleic acid vector comprising nucleic acid encoding a fusion polypeptide, said nucleic acid molecule comprising a nucleotide sequence encoding all or a portion of an amino acid sequence SEQ ID NO:4, and further comprising a nucleotide sequence encoding a heterologous portion of said fusion polypeptide.
35. A nucleic acid vector comprising nucleic acid comprising a nucleotide sequence which encodes a protein comprising the amino acid sequence SEQ ID NO:4, or SEQ ID NO:4 with conservative amino acid substitutions.
36. A nucleic acid expression vector comprising a coding sequence encoding mouse Ferroportin1.

37. A nucleic acid vector comprising a nucleic acid encoding a fusion polypeptide, said nucleic acid comprising a nucleotide sequence which encodes a contiguous portion of at least 15 amino acids of SEQ ID NO:4.
38. A cultured cell comprising the vector of Claim 33.
- 5 39. A cultured cell comprising the vector of Claim 34.
40. A cultured cell comprising nucleic acid having at least 80% nucleotide sequence similarity to a nucleic acid encoding a polypeptide comprising the amino acid sequence SEQ ID NO:4.
- 10 41. A cultured cell comprising nucleic acid comprising a nucleotide sequence which encodes a contiguous portion of at least about 15 amino acids of SEQ ID NO:4.
42. A cultured cell comprising nucleic acid comprising a nucleotide sequence which encodes a polypeptide having an iron transport function, wherein said nucleic acid hybridizes under high stringency conditions to SEQ ID NO:3 or its complement.
- 15 43. A method for producing a polypeptide, said method comprising culturing the cell of Claim 40 under conditions in which the cell produces the polypeptide.
44. A method for producing a polypeptide, said method comprising culturing the cell of Claim 42 under conditions in which the cell produces the polypeptide.

45. A method for producing a polypeptide, said method comprising culturing the cell of Claim 42 under conditions in which the cell produces the polypeptide, and isolating the polypeptide from the cell.

46. An isolated nucleic acid comprising the nucleotide sequence SEQ ID NO:5.

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5 47. An isolated nucleic acid having at least 80% nucleotide sequence identity to a nucleic acid encoding a polypeptide comprising the amino acid sequence SEQ ID NO:5.

48. An isolated nucleic acid comprising a nucleotide sequence which consists of the coding region of human Ferroportin1.

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10 49. An isolated nucleic acid comprising a nucleotide sequence which encodes a contiguous portion of at least 190 amino acids of SEQ ID NO:6.

50. An isolated nucleic acid consisting of a sequence of at least 575 contiguous nucleotides complementary to a region between nucleotides 305 and 2020 of SEQ ID NO:5.

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15 51. An isolated nucleic acid comprising a nucleotide sequence which encodes a naturally occurring allelic variant of a polypeptide consisting of the amino acid sequence of a Ferroportin1 protein, wherein said nucleic acid molecule hybridizes under high stringency conditions to the complement of the sequence SEQ ID NO:5.

52. An isolated nucleic acid which encodes a polypeptide having an iron transport function and is at least 457 amino acid residues long, wherein said molecule hybridizes under high stringency conditions to SEQ ID NO:5 or its complement.

53. An isolated nucleic acid which hybridizes under high stringency conditions to nucleic acid consisting of nucleotides 305 through 2020 within SEQ ID NO:5.

54. An isolated nucleic acid comprising a nucleotide sequence encoding a polypeptide, wherein said nucleotide sequence shares at least 80% sequence identity with the nucleotide sequence SEQ ID NO:5.

55. An isolated nucleic acid encoding a fusion polypeptide, said nucleic acid molecule comprising a nucleotide sequence encoding all or a portion of an amino acid sequence SEQ ID NO:6, and further comprising a nucleotide sequence encoding a heterologous portion of said fusion polypeptide.

56. An isolated nucleic acid comprising a nucleotide sequence which encodes a protein comprising the amino acid sequence SEQ ID NO:6, or SEQ ID NO:6 with conservative amino acid substitutions.

57. A nucleic acid vector comprising nucleic acid having at least 80% nucleotide sequence identity to a nucleic acid encoding a polypeptide comprising the amino acid sequence SEQ ID NO:6.

58. A nucleic acid vector comprising nucleic acid encoding a fusion polypeptide, said nucleic acid molecule comprising a nucleotide sequence encoding all or a portion of an amino acid sequence SEQ ID NO:6, and further comprising a nucleotide sequence encoding a heterologous portion of said fusion polypeptide.

59. A nucleic acid vector comprising nucleic acid comprising a nucleotide sequence which encodes a protein comprising the amino acid sequence SEQ ID NO:6, or SEQ ID NO:6 with conservative amino acid substitutions.

60. A nucleic acid vector comprising nucleic acid having at least 80% nucleotide sequence identity to a nucleic acid encoding a polypeptide comprising the amino acid sequence SEQ ID NO:5.

61. A nucleic acid expression vector comprising a coding sequence encoding human Ferroportin1.

62. A nucleic acid vector comprising a nucleic acid with at least 80% nucleotide sequence identity to the coding region of SEQ ID NO:5.

63. A nucleic acid vector comprising a nucleic acid encoding a fusion polypeptide, said nucleic acid comprising a nucleotide sequence which encodes a contiguous portion of at least 15 amino acids of SEQ ID NO:6.

64. A nucleic acid vector comprising a nucleic acid encoding a fusion polypeptide, said nucleic acid comprising a nucleotide sequence encoding all or a portion of an amino acid sequence SEQ ID NO:6, and further comprising a nucleotide sequence encoding a heterologous portion of said fusion polypeptide.

65. A cultured cell comprising the vector of Claim 59.

66. A cultured cell comprising the nucleic acid vector of Claim 63.

67. A cultured cell comprising nucleic acid having at least 80% nucleotide sequence similarity to a nucleic acid encoding a polypeptide comprising the amino acid sequence SEQ ID NO:2.

5 68. A cultured cell comprising nucleic acid comprising a nucleotide sequence which encodes a contiguous portion of at least about 15 amino acids of SEQ ID NO:2.

69. A cultured cell comprising nucleic acid comprising a nucleotide sequence which encodes a polypeptide having an iron transport function, wherein said nucleic acid hybridizes under high stringency conditions to SEQ ID NO:1 or its complement.

10 70. A method for producing a polypeptide, said method comprising culturing the cell of Claim 67 under conditions in which the cell produces the polypeptide.

71. A method for producing a polypeptide, said method comprising culturing the cell of Claim 67 under conditions in which the cell produces the polypeptide, and isolating the polypeptide from the cell or the culture medium.

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72. An isolated nucleic acid comprising the nucleotide sequence SEQ ID NO:7.

73. An isolated immunogenic polypeptide, the amino acid sequence of which comprises at least 19 consecutive amino acid residues of SEQ ID NO:2.

20 74. An isolated polypeptide comprising at least 10 amino acid residues of a cytoplasmic or extracellular domain of zebrafish Ferroportin1.

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75. An isolated polypeptide comprising the amino acid sequence SEQ ID NO:2, or SEQ ID NO:2 with at least one conservative amino acid substitution.
76. An isolated polypeptide, the amino acid sequence of which is at least 80% identical to SEQ ID NO:2.
- 5 77. An isolated polypeptide, the amino acid sequence of which is at least 80% similar to SEQ ID NO:2.
78. An isolated polypeptide the amino acid sequence of which consists of SEQ ID NO:2.
79. An isolated polypeptide produced by the method of Claim 21.
- 10 80. An isolated polypeptide encoded by a nucleic acid molecule comprising a nucleotide sequence which encodes a naturally occurring allelic variant of a polypeptide, the polypeptide consisting of the amino acid sequence of zebrafish Ferroportin1, wherein said nucleic acid molecule hybridizes to a complement of a nucleic acid molecule consisting of SEQ ID NO:1 under high stringency conditions.
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81. A fusion protein comprising a polypeptide selected from the group consisting of:
- 20 a) a naturally occurring allelic variant of a polypeptide, the polypeptide consisting of the amino acid sequence of zebrafish Ferroportin1 in SEQ ID NO:2;
- b) a polypeptide consisting of an amino acid sequence which is at least 95% identical to the amino acid sequence of SEQ ID NO:2;

- c) a polypeptide consisting of amino acid sequence SEQ ID NO:2; and
- d) a polypeptide comprising a contiguous portion of at least about 15 amino acid residues of any of the foregoing.

5 82. The fusion protein of Claim 81 wherein the fusion protein transports iron across a cell membrane or an artificial cell membrane system.

83. An isolated immunogenic polypeptide, the amino acid sequence of which comprises at least 19 consecutive amino acid residues of SEQ ID NO:4.

84. An isolated polypeptide comprising at least 10 amino acid residues of a cytoplasmic or extracellular domain of mouse Ferroportin1.

10 85. An isolated polypeptide comprising the amino acid sequence SEQ ID NO:4, or SEQ ID NO:4 with at least one conservative amino acid substitution.

86. An isolated polypeptide, the amino acid sequence of which comprises a sequence at least 80% identical to SEQ ID NO:4.

15 87. An isolated polypeptide, the amino acid sequence of which comprises a sequence at least 80% similar to SEQ ID NO:4.

88. An isolated polypeptide the amino acid sequence of which consists of SEQ ID NO:4.

89. An isolated polypeptide produced by the method of Claim 43.

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90. An isolated polypeptide encoded by a nucleic acid molecule comprising a nucleotide sequence which encodes a naturally occurring allelic variant of a polypeptide, the polypeptide consisting of the amino acid sequence of mouse Ferroportin1, wherein said nucleic acid molecule hybridizes to the complement of a nucleic acid molecule consisting of SEQ ID NO:4 under high stringency conditions.
91. A fusion protein comprising a polypeptide selected from the group consisting of:
- a) a naturally occurring allelic variant of a polypeptide, the polypeptide consisting of the amino acid sequence of mouse Ferroportin1 in SEQ ID NO:4;
 - b) a polypeptide consisting of an amino acid sequence which is at least 95% identical to the amino acid sequence of SEQ ID NO:4;
 - c) a polypeptide consisting of amino acid sequence SEQ ID NO:4; and
 - d) a polypeptide comprising a contiguous portion of at least about 15 amino acid residues of any of the foregoing.
92. The fusion protein of Claim 91 wherein the fusion protein transports iron across a cell membrane or an artificial cell membrane system.
93. An isolated immunogenic polypeptide, the amino acid sequence of which comprises at least 19 consecutive amino acid residues of SEQ ID NO:6.
94. An isolated polypeptide comprising at least 10 amino acid residues of a cytoplasmic or extracellular domain of human Ferroportin1.

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d) a polypeptide comprising a contiguous portion of at least about 15 amino acid residues of any of the foregoing.

102. The fusion protein of Claim 101 wherein the fusion protein transports iron across a cell membrane or an artificial cell membrane system.

5 103. A method for eliciting an immune response in an animal, said method comprising introducing into the animal a composition comprising a polypeptide comprising at least 19 consecutive amino acid residues of SEQ ID NO:2.

10 104. A method for eliciting an immune response in an animal, said method comprising introducing into the animal a composition comprising a polypeptide comprising at least 19 consecutive amino acid residues of SEQ ID NO:4.

105. A method for eliciting an immune response in an animal, said method comprising introducing into the animal a composition comprising a polypeptide comprising at least 19 consecutive amino acid residues of SEQ ID NO:6.

15 106. Antibodies that bind specifically to a Ferroportin1 protein, where antibodies include single-chain antibodies, chimeric antibodies and immunologically active fragments of antibodies.

107. A method for producing antibodies, said method comprising introducing into an animal isolated zebrafish Ferroportin1 or an immunogenic fragment of zebrafish Ferroportin1.

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108. A method for producing antibodies, said method comprising introducing into a non-murine animal isolated mouse Ferroportin1 or an immunogenic fragment of mouse Ferroportin1.
- 5 109. A method for producing antibodies, said method comprising introducing into a non-human animal isolated human Ferroportin1 or an immunogenic fragment of human Ferroportin1.
- 10 110. A method for identifying an agent which binds to a protein comprising an amino acid sequence SEQ ID NO:2, SEQ ID NO:4 or SEQ ID NO:6, or at least 10 contiguous amino acid residues of any of the foregoing, comprising the steps of contacting the agent with the isolated protein under conditions appropriate for binding of the agent to the isolated protein, and detecting a resulting agent-protein complex.
- 15 111. A method for identifying an agent which binds to a protein, said protein encoded by a polynucleotide comprising a nucleotide sequence which encodes a naturally occurring allelic variant of a polypeptide consisting of the amino acid sequence of human Ferroportin1, wherein said polynucleotide hybridizes to a complement of a polynucleotide consisting of SEQ ID NO:1, SEQ ID NO:3 or SEQ ID NO:5 under high stringency conditions, comprising the steps of isolating the protein, contacting the agent with the isolated protein under conditions appropriate for binding of the agent to the isolated protein, and detecting a resulting agent-protein complex.
- 20 112. A method for identifying an agent which inhibits interaction between an isolated polypeptide, the amino acid sequence of which is at least 80% similar to SEQ

ID NO:2, SEQ ID NO:4 or SEQ ID NO:6, and a ligand of said protein, comprising:

(a) combining:

- (1) said isolated polypeptide;
- (2) the ligand of said polypeptide; and
- (3) a candidate agent to be assessed for its ability to inhibit interaction between said polypeptide of (1) and the ligand of (2), under conditions appropriate for interaction between said polypeptide of (1) and the ligand of (2);

(b) determining the extent to which said polypeptide of (1) and the ligand of (2) interact; and

(c) comparing the extent determined in (b) with the extent to which interaction of said polypeptide of (1) and the ligand of (2) occurs in the absence of the candidate agent to be assessed and under the same conditions appropriate for interaction of said polypeptide of (1) with the ligand of (2);

wherein if the extent to which interaction of said polypeptide of (1) and the ligand of (2) occurs is less in the presence of the candidate agent than in the absence of the candidate agent, the candidate agent is an agent which inhibits interaction between said polypeptide and the ligand of said polypeptide.

113. The method of Claim 112 wherein (a) is performed in an artificial membrane system.

114. The method of Claim 112 wherein said isolated polypeptide is in isolated plasma membrane.

115. A method for identifying an agent which inhibits interaction between (1) an isolated protein, said protein being encoded by a polynucleotide comprising a nucleotide sequence which encodes a naturally occurring allelic variant of a polypeptide, said polypeptide consisting of the amino acid sequence of human Ferroportin1, wherein said polynucleotide hybridizes to a complement of a polynucleotide consisting of SEQ ID NO:5 under high stringency conditions and (2) a ligand of said protein, comprising:

(a) combining:

- (1) said isolated protein;
- (2) the ligand of said protein; and
- (3) a candidate agent to be assessed for its ability to inhibit interaction between said protein of (1) and the ligand of (2), under conditions appropriate for interaction between said protein of (1) and the ligand of (2);

(b) determining the extent to which said protein of (1) and the ligand of (2) interact; and

(c) comparing the extent determined in (b) with the extent to which interaction of said protein of (1) and the ligand of (2) occurs in the absence of the candidate agent to be assessed and under the same conditions appropriate for interaction of said protein of (1) with the ligand of (2);

wherein if the extent to which interaction of said protein of (1) and the ligand of (2) occurs is less in the presence of the candidate agent than in the absence of the candidate agent, the candidate agent is an agent which inhibits interaction between said protein and the ligand of said protein.

116. A method for identifying an agent which binds to a protein encoded by a nucleic acid encoding a human Ferroportin1 comprising an amino acid sequence sharing

at least about 95% amino acid sequence identity with the amino acid sequence SEQ ID NO:6, said method comprising the steps of isolating the protein, contacting the agent with the isolated protein under conditions appropriate for binding of the agent to the isolated protein, and detecting a resulting agent-protein complex.

117. A method for identifying an agent which binds to a protein encoded by a nucleic acid encoding a Ferroportin1 comprising an amino acid sequence sharing at least about 95% amino acid sequence similarity with the amino acid sequence in SEQ ID NO:2, SEQ ID NO:4 or SEQ ID NO:6 comprising the steps of isolating the protein, contacting the agent with the isolated protein under conditions appropriate for binding of the agent to the isolated protein, and detecting a resulting agent-protein complex.

118. The method of Claim 117 wherein the step of contacting the agent with isolated protein is performed in an artificial membrane system.

119. The method of Claim 117 wherein the isolated protein is in isolated plasma membrane.

120. A method for identifying an agent which is an inhibitor of iron export by a polypeptide comprising an amino acid sequence with at least 95% identity to SEQ ID NO:2, SEQ ID NO:4 or SEQ ID NO:6 comprising the steps of:

- a) maintaining test cells expressing said polypeptide in the presence of iron and an agent to be tested as an inhibitor of iron export;
- b) measuring export of the iron from the test cells; and
- c) comparing export of the iron from the test cells with export of iron from suitable control cells;

wherein lower export of the iron from the test cells compared to export of the iron from the control cells is indicative that the agent is an inhibitor of iron export by said protein.

121. A method for identifying an agent which is an inhibitor of iron export by a polypeptide comprising an amino acid sequence with at least 95% sequence similarity to SEQ ID NO:2, SEQ ID NO:4 or SEQ ID NO:6, comprising the steps of:

- a) maintaining test cells expressing said polypeptide in the presence of iron and an agent to be tested as an inhibitor of iron export;
- b) measuring export of the iron from the test cells; and
- c) comparing export of the iron from the test cells with export of iron from suitable control cells;

wherein lower export of the iron from the test cells compared to export of the iron from the control cells is indicative that the agent is an inhibitor of iron export by said polypeptide.

122. An inhibitor of iron export identified by the method of Claim 121.

123. The method of Claim 121 further comprising the steps of:

- a) administering the agent to one or more test animals;
- b) measuring exogenously supplied iron in one or more samples of tissue or bodily fluid from said test animals;
- c) measuring exogenously supplied iron in one or more comparable samples of tissue or bodily fluid from suitable control animals;
- d) comparing the iron of b) with the iron of c);

whereby, lower iron in step b) than in step c) is indicative that the agent is an inhibitor of said polypeptide.

124. An inhibitor of iron export identified by the method of Claim 121.

125. A method for identifying an agent which is an enhancer of iron export by a protein, said protein encoded by a polynucleotide comprising a nucleotide sequence which encodes a naturally occurring allelic variant of a polypeptide, the polypeptide consisting of the amino acid sequence of human Ferroportin1, wherein said polynucleotide hybridizes to a complement of a polynucleotide consisting of SEQ ID NO:5 under high stringency conditions, said method comprising the steps of:

- a) maintaining test cells containing iron and expressing said polynucleotide in the presence of an agent to be tested as an enhancer of iron export;
- b) measuring export of the iron from the test cells; and
- c) comparing export of the iron from the test cells with export of the iron from suitable control cells;

wherein greater export of the iron from the test cells compared to export of the iron from the control cells is indicative that the agent is an enhancer of iron export by said protein.

126. An enhancer of iron export identified by the method of Claim 125.

127. The method of Claim 125 further comprising the steps of:

- a) administering the agent to one or more test animals;
- b) measuring exogenously supplied iron in one or more samples of tissue or bodily fluid from said test animals;
- c) measuring exogenously supplied iron in one or more comparable samples of tissue or bodily fluid from suitable control animals;
- d) comparing the iron of b) with the iron of c);

whereby, higher iron in step b) than in step c) is indicative that the agent is an enhancer of said protein.

128. A method for identifying an agent which is an inhibitor of a protein, said protein being encoded by a nucleic acid encoding a Ferroportin1 comprising an amino acid sequence sharing at least about 95% amino acid sequence identity with the amino acid sequence in SEQ ID NO:2, SEQ ID NO:4 or SEQ ID NO:6, comprising the steps of:

- a) introducing into host cells one or more vectors or RNAs comprising a polynucleotide sequence expressing said protein;
- b) culturing said host cells with iron under conditions permitting uptake of iron into said host cells;
- c) culturing a first aliquot of the host cells of b) with an agent being tested as an inhibitor of said protein;
- d) culturing a second aliquot of the host cells of b) without said agent;
- e) determining, in the first and second aliquots, export of iron from the host cells;

wherein less export of iron from the first aliquot compared to the export of iron from the second aliquot is indicative that the agent is an inhibitor of said protein.

129. A method for identifying an agent which is an enhancer of a protein, said protein being encoded by a nucleic acid encoding a Ferroportin1 comprising an amino acid sequence sharing at least about 95% amino acid sequence similarity with the amino acid sequence in SEQ ID NO:2, SEQ ID NO:4 or SEQ ID NO:6, comprising the steps of:

- a) introducing into host cells one or more vectors or RNAs comprising a polynucleotide sequence expressing said protein;

- b) culturing said host cells with iron under conditions permitting uptake of iron into said host cells;
- c) culturing a first aliquot of the host cells of b) with an agent being tested as an inhibitor of said protein;
- 5 d) culturing a second aliquot of the host cells of b) without said agent;
- e) determining, in the first and second aliquots, export of iron from the host cells;

wherein greater export of iron from the first aliquot compared to the export of iron from the second aliquot is indicative that the agent is an enhancer of said protein.

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130. The method of Claim 129 further comprising the steps of:

- a) administering the agent to one or more test animals;
- b) measuring exogenously supplied iron in one or more samples of tissue or bodily fluid from suitable control animals;
- 15 c) determining exogenously supplied iron in one or more comparable samples of tissue or bodily fluid from suitable control animals; and
- d) comparing the iron of b) with the iron of c).

whereby, lower iron in step b) than in step c) is indicative that the agent is an inhibitor of said protein.

20 131. A method for treating hemochromatosis in a human, said method comprising administering to the human an inhibitor of Ferroportin1 iron transport function.

132. A method for treating a disease or medical disorder resulting from oxidative damage in a mammal, said method comprising administering to the mammal an inhibitor of Ferroportin1 iron transport function.

133. A method for treating iron deficiency anemia in a mammal, said method comprising administering to the mammal an enhancer of Ferroportin1 iron transport function.

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